

DIRECT TESTIMONY OF
ERIK STUEBE
IN
DOCKET NO. 2017-281-E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Erik Stuebe and my business address is Ecoplexus, Inc., 101 2nd Street, Suite 1250, San Francisco, CA 94105.

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I have a BSB in Finance from the University of Minnesota, and a Masters of Business Administration (MBA) from Harvard Business School. Prior to co-founding Ecoplexus in 2009, I had approximately 20 years of professional experience in investment banking, real estate, and consumer products.

Q. DESCRIBE YOUR WORK EXPERIENCE WITH ECOPLEXUS.

A. Over the last eight years, I have been the President of Ecoplexus, Inc., during which time Ecoplexus has completed seven tax equity funds for approximately 170 MW of solar projects, representing project costs of over \$300 million. Ecoplexus has also developed and provided engineering, procurement, and construction (EPC) services for an additional 100 MW totaling over \$150 million in project value.

During my tenure at Ecoplexus, the Company has developed and financed seventy-five projects with Power Purchase Agreement's, ("PPAs"), in California, North

1 Carolina, Georgia, Colorado, and Minnesota. Counterparties include nine utilities, and
2 more than ten municipalities or State agencies, and more than fifty corporate entities
3 including a number of Fortune 500 companies.
4

5 **Q. PLEASE DESCRIBE YOUR BUSINESS EXPERIENCE AS IS RELATED TO**
6 **REGULATORY MATTERS REGARDING THE SOLAR INDUSTRY IN SC**

7 **A.** Over the last 8 years, I have been involved in regulatory matters in each of approximately
8 10 states, including the 5 states in which Ecoplexus has successfully completed projects.
9 The Company's decision to commence business operations in a state begins with an
10 assessment of the regulatory landscape in that state. In 2012, Ecoplexus commenced an
11 evaluation of the potential solar market in South Carolina, which included an assessment
12 of the regulatory landscape in South Carolina. A key component analysis was evaluating
13 the PPA terms offered by the utilities operating in the State. Ecoplexus was familiar with
14 Duke Carolina's Standard Offer 15-year PPA in North Carolina, and one of the decision
15 factors to enter the South Carolina market was the similar offering of a 15-year standard
16 offer PPA in South Carolina.

17 Since 2012, we have stayed apprised of regulatory developments in South
18 Carolina through working with attorneys, developer groups, and through direct research
19 and involvement with the Public Service Commission of South Carolina. For example,
20 we were aware that in July 2015, Duke Energy Carolinas, LLC, ("DEC") agreed to solicit
21 offers for 15 year PPA's for approximately 40 MW of new renewable energy capacity
22 located in its retail service area in South Carolina, as part of a settlement with solar
23 developers and Walmart. Ecoplexus committed substantial capital and resources to

development efforts in South Carolina based on the expectation that DEC would continue to offer 15 year PPA's as it had in the past. We were therefore surprised and greatly concerned when Duke notified developers in 2017 that Duke intended to reduce the PPA terms Duke offered in South Carolina, to 5 years.

Q. ON WHOSE BEHALF ARE YOU PROVIDING THIS TESTIMONY?

A. Ecoplexus, Inc.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. No. I have not had the privilege of appearing before this Commission.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY

A. The purpose of my testimony is to support the position of Ecoplexus, Inc., relevant to the Complaint filed in this matter.

Q. PLEASE DESCRIBE ECOPLEXUS' EXPERIENCE IN OBTAINING FINANCING FOR ECOPLEXUS' SOLAR PROJECTS.

A. Over the last eight years, Ecoplexus has successfully secured financing for seventy-five solar PPA's with 9 utilities, 10 municipalities/state agencies, and over 50 corporate entities, in 5 different States. These utilities include Pacific Gas and Electric, Georgia Power, Duke Energy Carolinas, Duke Energy Progress, Dominion North Carolina Power, Xcel Energy – Colorado, Xcel Energy – Minnesota, Southern California Edison, and Sacramento Municipal Utility District. The municipalities and State Agencies include the

1 State of California – Department of General Services, The State of California –
2 Department of Corrections and Rehabilitation, Santa Clara County (CA), and Sutter
3 County (CA), among others. Corporate offtakers with which Ecoplexus has signed PPA
4 contracts include Fortune 500 companies such as Medtronic PLC and Ecolab, Inc., and
5 large private companies such as Andersen Corporation (Windows and Doors) and
6 Unimin Corporation. The average PPA term for these contracts, is 22.8 years, and is
7 summarized below and identified in detail in Exhibit ES-1.

8 **Q. PLEASE DESCRIBE YOUR CONCERNS WITH DUKE OFFERING ONLY 5**
9 **YEAR TERM PPAS.**

10 **A.** At this time, assuming South Carolina avoided cost rates remain similar to recent levels, a
11 PPA term of less than 15 years will be insufficient to secure reasonable and adequate
12 financing. Generally speaking, with respect to financing: (i) investors require that the
13 project generate a revenue stream that will satisfy the senior debt as well as the operating
14 and maintenance costs of the facility over the term of the loan; (ii) the term of the loan
15 must be long enough to ensure coverage of principle and interest payments that make the
16 project financially feasible; (iii) the less debt financing a project can support, the more
17 equity financing the project requires; (iv) the more equity financing that is required, the
18 lower the return on equity that a project will generate; and (v) in today's capital markets,
19 if equity returns do not exceed a certain investor threshold level, then a project will not be
20 able to obtain the financing necessary to construct and operate the project. Therefore, the
21 PPA term has a direct causal relationship in determining whether a project can secure
22 reasonable financing.

1 **Q. DESCRIBE THE ADVANTAGES OF LONG-TERM FINANCING.**

2 **A.** With respect to these general principles, debt financing is less expensive than equity
3 financing. Longer term PPAs will generally provide for longer term financing and
4 therefore a greater portion of the project's cost can be financed with less expensive debt.

5 The letter attached hereto as Exhibit ES - 2, which has been provided by
6 Greentech Capital Advisors (GCA), the largest investment bank and asset management
7 firm focused exclusively on sustainable energy and infrastructure, provides additional
8 support for the general principles, by explaining the relationship between debt financing,
9 equity financing and PPA term. Specifically, Greentech Capital Advisors notes that: Debt
10 lenders typically require debt to be repaid fully inside of the PPA tenor. If the PPA tenor
11 is reduced by $\sim 1/3$, the amount of low cost debt that the project can support is
12 commensurately decreased (senior debt is typically the lowest cost of capital available to
13 fund solar projects). This reduction in debt capacity leads to a one-for-one increase in
14 requisite equity funding, resulting in equity returns that are typically below investor
15 threshold levels.

16 Cash equity investors strongly prefer longer term contracted cash flows and are
17 generally uncomfortable having uncontracted project cash flows representing a majority
18 of the estimated 30-year project life for solar assets. Additionally, Greentech Capital
19 Advisors provides market insight by noting that: The level of investor appetite for shorter
20 term PPAs can also be seen analyzing the tenor of PPAs entered into historically.

21 **According to SNL Financial (a division of S&P Global Market Intelligence), of the**
22 **>900 solar PPAs in their database with start dates of 2007 through 2017, only 2%**
23 **have PPA tenors less than or equal to 10 years. Over 72% of the PPAs have tenors of**

1 15 years or greater (from Exhibit ES – 2). Thus, GCA’s market research provides
2 compelling evidence that a PPA term of 10 year or fewer inhibits financing and
3 discourages QF development. Finally, Greentech Capital Advisors concludes that “...if
4 the term of the PPA were 15 years or greater, investors would have a far higher
5 likelihood of achieving the 8-10% levered, after-tax returns required, required by equity
6 investors to finance such projects. Greentech Capital Advisors’ conclusion is consistent
7 with Ecoplexus’ experience that equity investors require a minimum return in the range
8 of 8% - 10%. (see, Exhibit ES-2).

9 **Q. WILL ECOPLEXUS BE ABLE TO CONTINUE FINANCING AND BUILDING**
10 **SOLAR PROJECTS IN SOUTH CAROLINA, WITH DUKE ONLY OFFERING 5**
11 **YEAR TERM PPAS?**

12 **A.** No. Based on Ecoplexus’ extensive project finance experience and based on the
13 experience of the leading investment bank for energy and infrastructure projects, and
14 given the current avoided cost rates in South Carolina; PPA’s with terms shorter than 15
15 years will not be financeable in South Carolina. A summary of Ecoplexus’ financial
16 model, which was produced in partnership with Novogradac & Company LLP, one of the
17 leading renewable energy accounting firms, is presented in the chart in Exhibit ES- 3.
18 The financial summary provides a summary of the results from the financial model which
19 clearly demonstrate that a PPA of greater than or equal to 15 years is necessary for the
20 projects to be deemed financeable.

Q. HAS ECOPLEXUS HAD EXPERIENCE IN DEVELOPING AND FINANCING PROJECTS IN MARKETS WITH PPA TERMS OF LESS THAN 15 YEARS?

A. Yes. In general, Ecoplexus will not invest development capital in markets in which PPA's of 15 years or greater are not available; however, we have experience in several markets in which the PPA terms were reduced by utilities after Ecoplexus had already invested substantial development capital. In the case of our experience in Idaho and Montana, Ecoplexus, after evaluating financing options, made the decision to abandon the Company's development stage projects after the local utilities reduced the PPA term below 15 years. Based on our discussions with the utilities and based on the response of the local utility commissions, we did not believe the PPA term would return to above 15 years in the near future, and understanding that the PPA's were not financeable with terms shorter than 15 years, we made the decision to exit those markets.

In North Carolina, Ecoplexus financed more than 10 projects with 15-year PPA's, before Duke reduced the PPA term to from 15 years to 10 years. In certain cases in which our LEO provided us with a high enough PPA rate, we were able to finance 10 year PPA's. In cases where the PPA rate was not high enough, we were not able to finance the projects.

1 **Q. ARE YOU AWARE THAT THERE ARE A FEW MARKETS WHERE PPA**
2 **TERMS HAVE BEEN REDUCED TO LESS THAN 15 YEARS? IF SO, PLEASE**
3 **EXPLAIN.**

4 **A.** Yes. I am aware of a small number of markets which have recently reduced the PPA term
5 offered to less than 15 years. For markets such as Idaho and Montana, the reduction in
6 the PPA term to less than 15 years resulted in “killing” the market for QF’s. To our
7 knowledge, no projects were developed in these markets after the reduction of the PPA
8 terms. In Montana, one of the utility commissioners stated that he believed the purpose
9 of reducing the PPA term offered to QF’s was to put an end to the QF market in
10 Montana. (Billingsgazette.com, Article by Tom Lutey, dated June 27, 2017).

11
12 **Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

13 **A.** Yes.
14

EXHIBIT

ES - 1

Ecoplexus Inc.

PPA Terms for Ecoplexus Financed Projects (2010 - 2017)

#	Developer	Facility name	Operation Date	of PPA	State	Offtaker
1	Ecoplexus	Alton - Fellowship Manor	3/8/2010	25	California	Alton Mgmt.
2	Ecoplexus	Alton - Jones Senior	5/7/2010	25	California	Alton Mgmt.
3	Ecoplexus	Riverhouse Hotel-0078	8/24/2010	25	California	Eden Housing
4	Ecoplexus	Alton - Jones Sutter	9/9/2010	25	California	Alton Mgmt.
5	Ecoplexus	Vandenburgh Villa Apts	9/10/2010	25	California	Eden Housing
6	Ecoplexus	Alton - Prince Hall	10/7/2010	25	California	Alton Mgmt.
7	Ecoplexus	Fuller Gardens	10/18/2010	25	California	Eden Housing
8	Ecoplexus	Alton - Banneker	11/10/2010	25	California	Alton Mgmt.
9	Ecoplexus	Alton - Laurel Gardens	11/17/2010	25	California	Alton Mgmt.
10	Ecoplexus	Wicklow Square	12/3/2010	25	California	Eden Housing
11	Ecoplexus	Eden Issei Terrace	12/10/2010	25	California	Eden Housing
12	Ecoplexus	Casa de Los Amigos	1/25/2011	25	California	Eden Housing
13	Ecoplexus	Eden Baywood Apartments	2/23/2011	25	California	Eden Housing
14	Ecoplexus	Stone Pine Meadow	3/15/2011	25	California	Eden Housing
15	Ecoplexus	Community Heritage Senior Housing	3/23/2011	25	California	Eden Housing
16	Ecoplexus	Ohlone Chynoweth Commons	3/24/2011	25	California	Eden Housing
17	Ecoplexus	Eden Lodge	5/12/2011	25	California	Eden Housing
18	Ecoplexus	Sundance	6/1/2011	25	California	Heartland Realty
19	Ecoplexus	Eden Wisteria	6/1/2011	25	California	Eden Housing
20	Ecoplexus	Brentwood Senior	6/30/2011	25	California	Eden Housing
21	Ecoplexus	Downtown River	7/19/2011	25	California	Eden Housing
22	Ecoplexus	Sara Connor	7/21/2011	25	California	Eden Housing
23	Ecoplexus	Eden Hillview Glen	7/22/2011	25	California	Eden Housing
24	Ecoplexus	Ridgeview Commons	7/27/2011	25	California	Eden Housing
25	Ecoplexus	Eden Villa Springs	8/3/2011	25	California	Eden Housing
26	Ecoplexus	Yuba City	8/31/2011	25	California	CAHASC
27	Ecoplexus	Eden West Rivertown	9/7/2011	25	California	Eden Housing
28	Ecoplexus	Eden Union Court	9/9/2011	25	California	Eden Housing
29	Ecoplexus	Eden Josephine Lum Lodge	9/15/2011	25	California	Eden Housing
30	Ecoplexus	Eden Sequoia	10/20/2011	25	California	Eden Housing
31	Ecoplexus	Eden Nugent Square	10/26/2011	25	California	Eden Housing
32	Ecoplexus	Victoria Green	11/16/2011	25	California	Eden Housing
33	Ecoplexus	Santa Clara County	12/27/2011	20	California	Santa Clara County
34	Ecoplexus	SBWMA	12/28/2011	20	California	SBWMA
35	Ecoplexus	Hayward Senior	1/26/2012	25	California	Eden Housing
36	Ecoplexus	Eden Palms	6/1/2012	25	California	Eden Housing
37	Ecoplexus	Valencia Gardens	6/15/2012	25	California	Mission Housing
38	Ecoplexus	City of Milpitas - Gibraltar Reservoir and Pump Station	11/8/2012	20	California	City of Milpitas
39	Ecoplexus	City of Milpitas - Service Yard	11/8/2012	20	California	City of Milpitas
40	Ecoplexus	City of Milpitas - Sports Center	11/8/2012	20	California	City of Milpitas
41	Ecoplexus	Little Zion	11/28/2012	25	California	Heartland Realty
42	Ecoplexus	Jamestown - PGE SRG Project	12/29/2013	20	California	PG&E
43	Ecoplexus	Sparta, GA	5/7/2014	25	Georgia	Georgia Power
44	Ecoplexus	Grand Junction, CO	10/10/2014	25	Colorado	Xcel Energy
45	Ecoplexus	Sterling, CO - CDOC	10/13/2014	25	Colorado	Xcel Energy
46	Ecoplexus	Sterling, CO - Horner	10/28/2014	25	Colorado	Xcel Energy
47	Ecoplexus	Elm City, NC - Langley	12/23/2014	15	North Carolina	Duke Energy Progress
48	Ecoplexus	Cordova, NC - Pecan	12/29/2014	15	North Carolina	Duke Energy Progress
49	Ecoplexus	Fayetteville, NC - Carter	12/31/2014	15	North Carolina	Duke Energy Progress
50	Ecoplexus	Shawboro, NC - Shawboro	9/9/2015	15	North Carolina	Dominion North Carolina Power
51	Ecoplexus	Mebane, NC - Ouchchy	12/31/2015	15	North Carolina	Duke Energy Carolinas
52	Ecoplexus	Snow Hill, NC - Thorton	12/31/2015	15	North Carolina	Duke Energy Progress
53	Ecoplexus	Claremont, NC - Old Catawba	12/15/2015	15	North Carolina	Duke Energy Carolinas
54	Ecoplexus	Asheboro - Little River	12/18/2015	15	North Carolina	Duke Energy Progress
55	Ecoplexus	Aulander, NC - Bradley	12/30/2015	15	North Carolina	Dominion North Carolina Power
56	Ecoplexus	Whitakers, NC - Watson Seed	12/31/2015	15	North Carolina	Dominion North Carolina Power
57	Ecoplexus	Williamston, NC - Meadows	6/8/2016	15	North Carolina	Dominion North Carolina Power

58	Ecoplexus	City of Corning, CA	6/30/2016	20	California	City of Corning
59	Ecoplexus	California Department of Public Health - Richmond Lab	6/30/2016	20	California	State of California
60	Ecoplexus	Franchise Tax Board - Sacramento, CA	6/30/2016	20	California	State of California
61	Ecoplexus	Kirby, NC - Turkey Creek	Q4 2016	10	North Carolina	Dominion North Carolina Power
62	Ecoplexus	Murfreesboro, NC - Benthall Bridge	12/29/2016	15	North Carolina	Dominion North Carolina Power
63	Ecoplexus	Aulander, NC - Baker	12/29/2016	15	North Carolina	Dominion North Carolina Power
64	Ecoplexus	Andersen Windows - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
65	Ecoplexus	Bloomington School District - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
66	Ecoplexus	City of Hopkins - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
67	Ecoplexus	District Cooling - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
68	Ecoplexus	Ecolab Inc. - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
69	Ecoplexus	Eden Prairie ISD 272 - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
70	Ecoplexus	Macalester College - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
71	Ecoplexus	YMCA of the Greater Twin Cities - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
72	Ecoplexus	Unimin Corporation - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
73	Ecoplexus	Eastgate Farms - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
74	Ecoplexus	██████████ - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
75	Ecoplexus	██████████ - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
76	Ecoplexus	Health Partners - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
77	Ecoplexus	Medtronic, Inc - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
78	Ecoplexus	Spring Lake Park Schools - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
79	Ecoplexus	Chisago Lakes Wastewater Treatment - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
80	Ecoplexus	Chisago County - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
81	Ecoplexus	City of Oakdale - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
82	Ecoplexus	██████████ - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
83	Ecoplexus	Met Council - Env Services - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
84	Ecoplexus	API Group - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
85	Ecoplexus	Ecolab Inc. - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
86	Ecoplexus	██████████ - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
87	Ecoplexus	██████████ - MN Subscriber	Jan. 2018	25	Minnesota	Xcel Energy
Total Average				22.8		

EXHIBIT

ES - 2



October 16, 2017

Public Service Commission of South Carolina
101 Executive Center Drive, Suite 100
Columbia, SC 29210

RE: Ecoplexus – Proposed Power Purchase Agreements (“PPAs”)

Dear Public Service Commission of South Carolina,

I am writing in regards to Duke’s proposed PPAs that were tendered to Qualified Facilities in South Carolina to Ecoplexus, Inc.

Greentech Capital Advisors (“GCA”) is the largest global investment bank and asset management firm focused exclusively on sustainable infrastructure. Our firm’s mission is to empower companies and investors that are creating more efficient and sustainable global infrastructure. Since inception in 2009, GCA has completed merger & acquisition advisory mandates exceeding \$10 billion in value and raised over \$4 billion of capital for our clients. Renewable power generation is a key area of focus for GCA’s advisory business and in the past four years alone our firm has been mandated on transactions representing >11 GW of power generation capacity across the globe.

As an advisor, GCA is consistently in the market speaking to renewable energy project investors. In our experience, the number of cash equity investors interested in projects with short-term PPAs (defined as 15 years or less) is dramatically lower than the number of cash equity investors interested in projects with PPA tenors of 15 years or longer. This interest differential is due primarily to the following factors:

- Debt lenders typically require debt to be repaid fully inside of the PPA tenor. If the PPA tenor is reduced by ~1/3, the amount of low cost debt that the project can support is commensurately decreased (senior debt is typically the lowest cost of capital available to fund solar projects). This reduction in debt capacity leads to a one-for-one increase in requisite equity funding, resulting in equity returns that are typically below investor threshold levels unless PPA prices are increased;
- Cash equity investors strongly prefer longer term contracted cash flows, and are generally uncomfortable having uncontracted project cash flows representing a majority of the estimated 30 year project life for solar assets.

The level of investor appetite for shorter term PPAs can also be seen analyzing the tenor of PPAs entered into historically. According to SNL Financial (a division of S&P Global Market Intelligence), of the >900 solar PPAs in their database with start dates of 2007 through 2017, only 2% have PPA tenors less than or equal to 10 years. Over 72% of the PPAs have tenors of 15 years or greater.

We do believe that if the PPA term were 15 years or greater for the South Carolina projects, investors would have a far higher likelihood of achieving the 8-10% levered, after-tax returns required by equity investors to finance such projects.

Greentech Capital Advisors, LLC
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This letter is for the attention of the Public Service Commission of South Carolina in relation to Ecoplexus' PPA discussions with Duke Energy Carolinas, LLC. and Duke Energy Progress, LLC. and cannot be reproduced, disseminated or used for any purpose without the written consent of Greentech Capital Advisors, LLC.

Thank you for your consideration of this letter.

Respectfully submitted,


Derek Bentley

EXHIBIT

ES - 3

*Impact of PPA Term Length on
Debt Capacity, Equity Returns, and Financeability*
November 2017

ecoplexus SOLAR ENERGY SOLUTIONS

Slide Summary

Slide 1

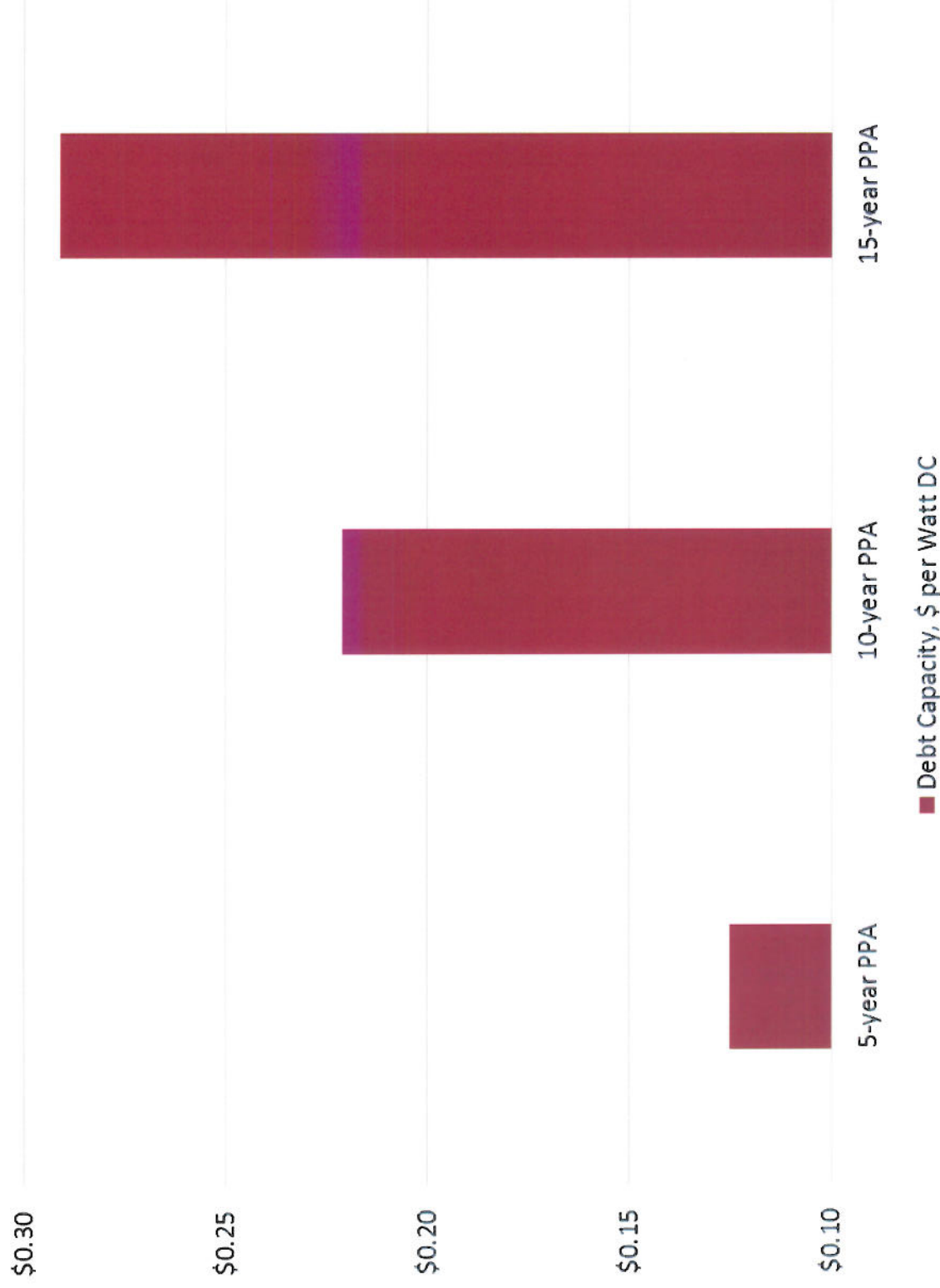
PPA term lengths significantly impact the amount of debt capacity a project can support, because lenders only underwrite contracted revenues.

Using avoided cost PPA rates provided in Q3 2017 by DEC for South Carolina, and industry standard cost and debt assumptions, we show the amount of debt a project with 5, 10, and 15-year PPAs can support.

Slide 2

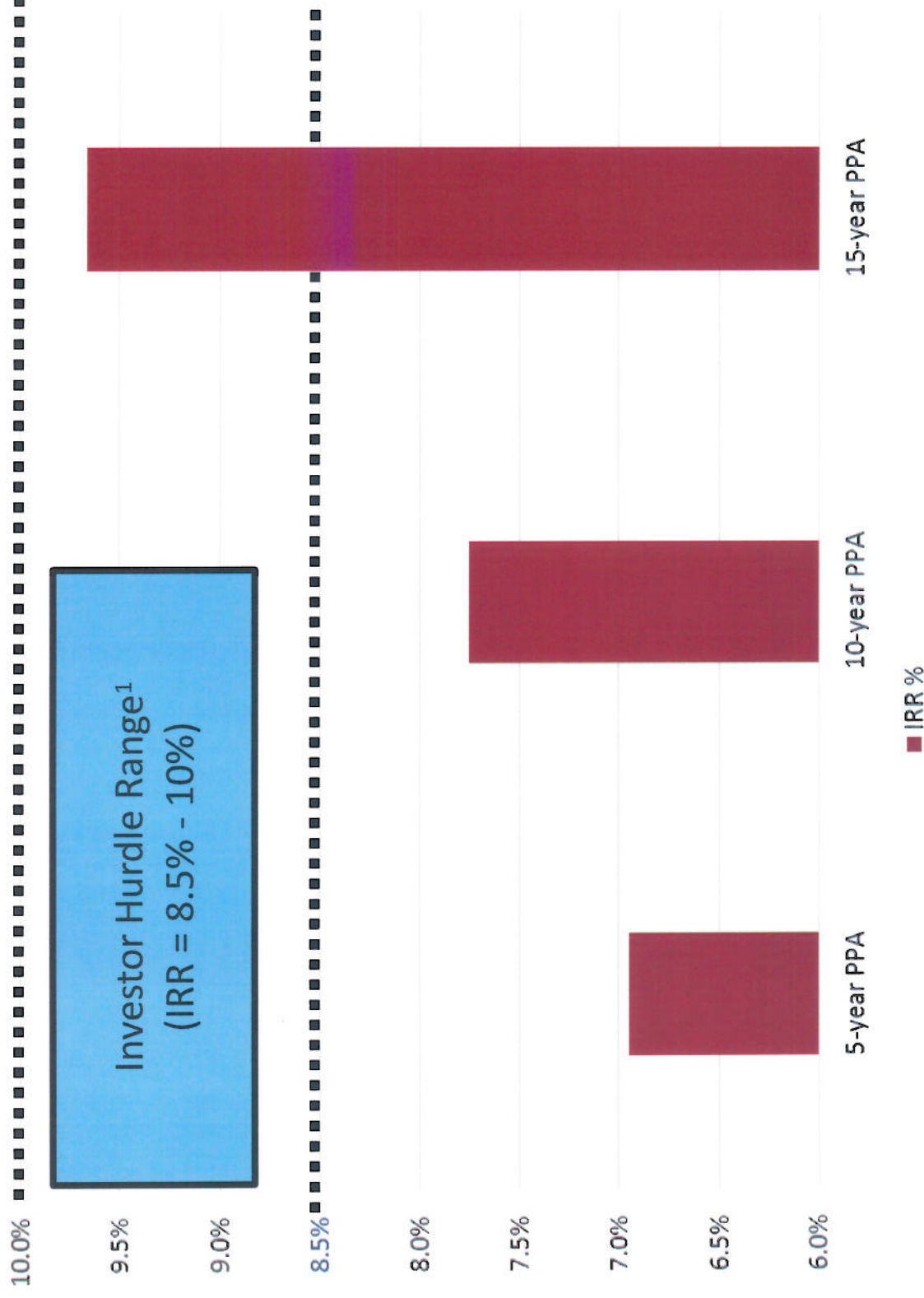
Smaller loan sizes, resulting from shorter PPA terms, decrease equity returns below standard investor hurdle rates, thus prohibiting the developer's ability to find equity investors for the project and deeming the project unfinanceable.

Debt Capacity vs PPA Term



Debt
Capacity

Return on Equity vs PPA Term



1. Levered After-tax Internal Rate of Return (IRR)

Conclusion

As demonstrated in the previous slides, based on the rates provided by Duke Energy Carolinas in Q3 2017, the PPA's are not financeable with a term of less than 15 years.